quercetin are here reported for the first time from the genus *Dryopteris* whereas apigenin has previously been found in a single species of this genus, *D. setigera* by Voirin (Ph. D. thesis, University of Lyon. 1970). As shown in a review by Markham (1988) and in a review by Imperato (2000) apigenin has previously been found in a number of fern species belonging to *Pteridium, Notholaena, Hymenophyllum, Pteris and Cheilanthes* whereas kaempferol together with quercetin have been found in a number of fern species belonging to *Asplenium, Blechnum, Hymenophyllum, Marattia, Anemia, Lygodium and Mohria*; in addition kaempferol has been found in *Notholaena* and *Trichomanes* whereas quercetin has been identified in the genus *Botrychium*.

It is of interest to note that apigenin, kaempferol and quercetin in *Dryopteris villarii* are not "external" flavonoids (i.e. flavonoid aglycones occurring on outside of the fronds) because Wollenweber *et al.* (Phytochemistry 48: 931–939. 1998) reported the absence of flavonoids among the compounds produced by external glands of leaves of *D. villarii* and *D. arguta* (Kaulf.) Maxon; Wollenweber *et al.* (1998) found that the external glands of these two ferns produce acylphloroglucinols whereas Widen *et al.* (Botanica Helvetica 101:77–120. 1991) identified acylphloroglucinols in rhizomes of *D. villarii* and *D. arguta*; the acylphloroglucinol composition of external glands is different from that of rhizomes. Wollenweber *et al.* (1998) suggested that acylphloroglucinols may have an ecophysiological function and it has been reported by Clarke and Harvey (pp. 197–198, *Veterinary Toxicology, 2nd ed.*, Ballaire Tindall, London. 1981) that rhizome acylphloroglucinols of *Dryopteris filix-mas* produce neurotoxic effects in cattle eating rhizomes and fronds of this fern.

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***Deparia longipes* (Woodsiaceae) Native to Taiwan.**—*Athyriopsis longipes* Ching is characterized by its peculiar long-creeping rhizome, herbaceous leaf texture, and serrate pinnule margin (Ching, Acta Phytotax. Sin. 41–85. 1964). It has been recorded only from Sichuan, Yunnan and Hunan provinces in China (Ching, 1964; Chu, Fl. Republ. Pop. Sin. 3(2): 1–566. 1999); however, a large wild population of it has been discovered at a site in Taichung, Suyuanyakou in Taiwan (Fig 1, 2). This is the first record of this species outside mainland China. The site is located (Fig. 2) approximately 800 km east of the nearest known locality at Ling Xian, Hunan province in China (Chu, 1999). We found many individuals growing on forest margins along trails or roadsides. Two plants were collected for cytological analysis. The vouchers (020606007 and 020606008) were deposited in the Herbarium of the Department of Botany, Graduate School of Science, Kyoto University (KYO).

Cytological observation of *Athyriopsis longipes* showed a chromosome number of $2n = 80$ (Fig. 3) at its newly discovered location. This number is

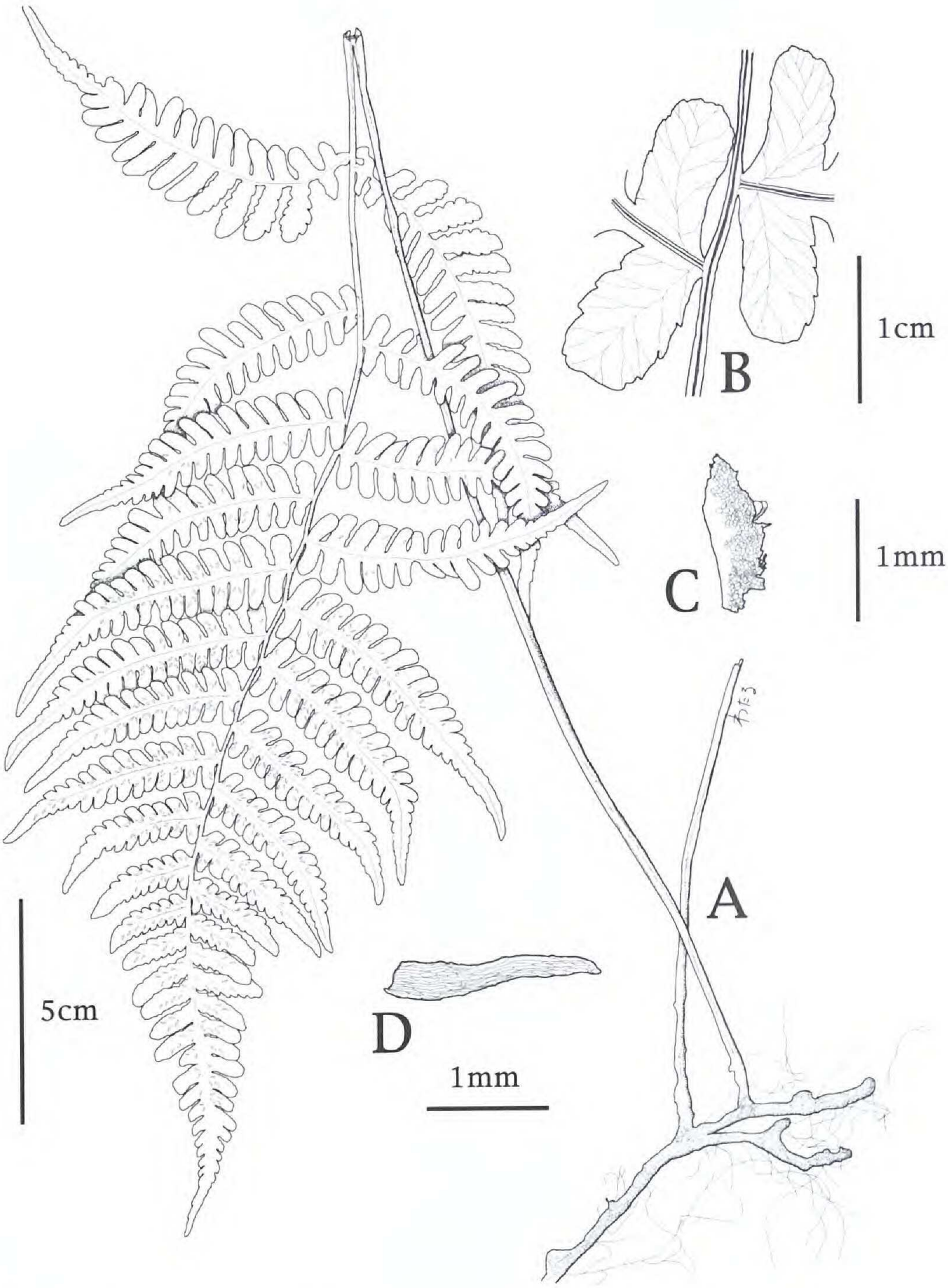

FIG. 1. *Deparia longipes*. A) Frond. B) Central lamina showing the shallow rachis groove which does not open at the junctions with the costae. C) indusium. D) Lamina scale.

regarded as diploid (Takamiya, *Index to Chromosomes of Japanese Pteridophyta*, Tokyo, Pterid. Soc., 1996).

Hooker and Greville (Icones Filicum 2: t. 154) established *Deparia* in 1829 based on *Deparia prolifera*. Kato (Bot. Mag. Tokyo 90: 23–40. 1977; J. Fac. Sci. Univ. Tokyo, Sect. 3, 13: 375–430. 1984) emphasized the similarities of the articulate hairs, leaf architecture, and leaf segmentation of *Deparia*, *Athyriopsis*, *Dryoathyrium*, and *Lunathyrium*. He considered that the monotypic genus *Deparia* is congeneric with the other three genera, and relegated *Athyriopsis sensu* Ching (1964) to one of the four sections of the genus

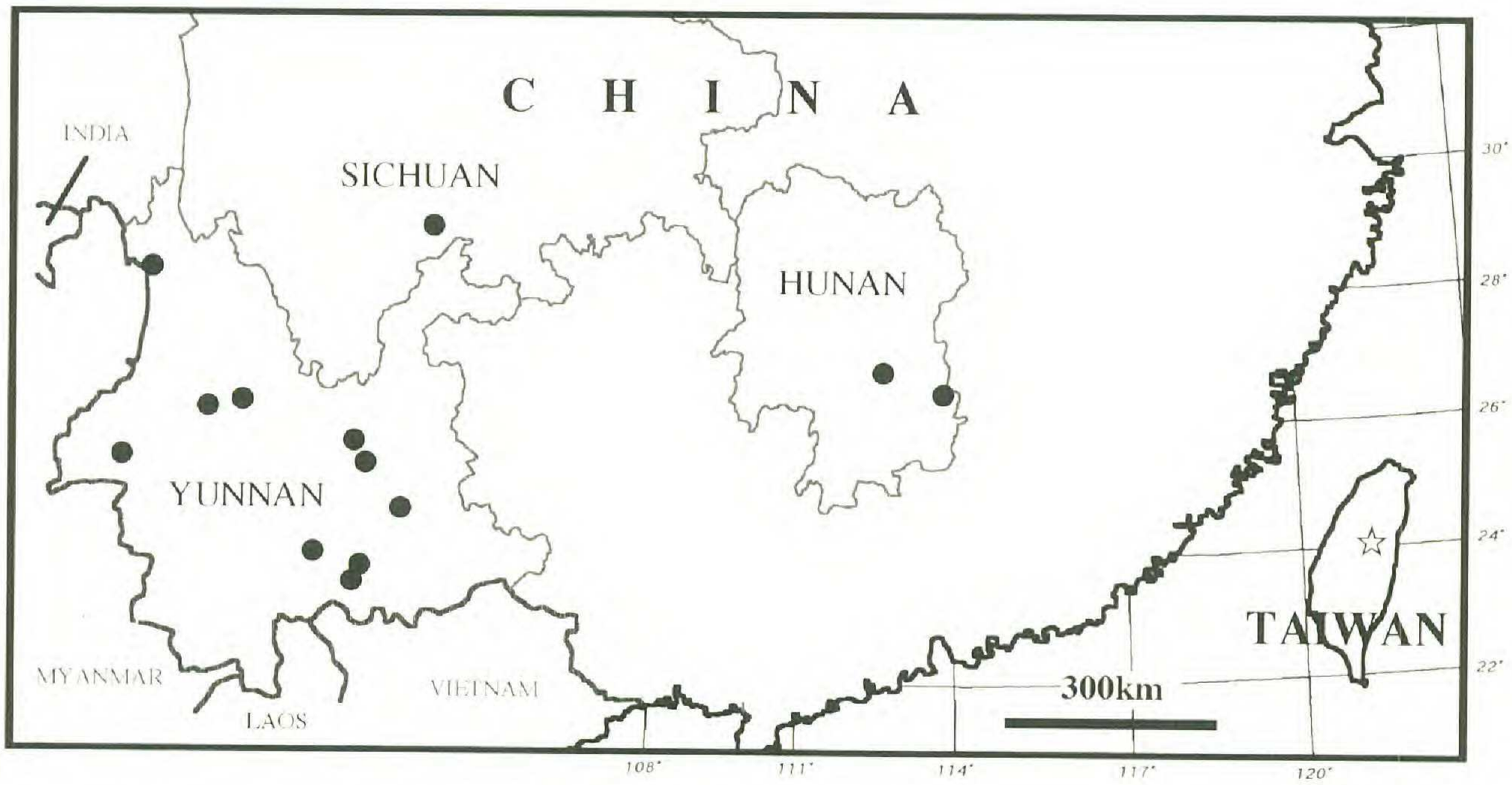

FIG. 2. Geographical distribution of *Deparia longipes*. The dots represent localities for *D. longipes* reported by Ching (1964) and Chu (1999), the star shows the new locality of *D. longipes* found in the present study.

Deparia. A molecular phylogenetic tree based on the nucleotide sequences of the *rbcL* gene made by Sano *et al.* (Mol. Phylog. Evol. 15: 403–413. 2000) revealed the monophyly of the four sections of the genus *Deparia* sensu Kato (1977; 1984), whereas interspecific relationships within *Athyriopsis* sensu Ching were not well resolved. Therefore, in agreement with Kato (1977; 1984), we transfer *A. longipes* from *Athyriopsis* to *Deparia* sensu Kato, as indicated below.

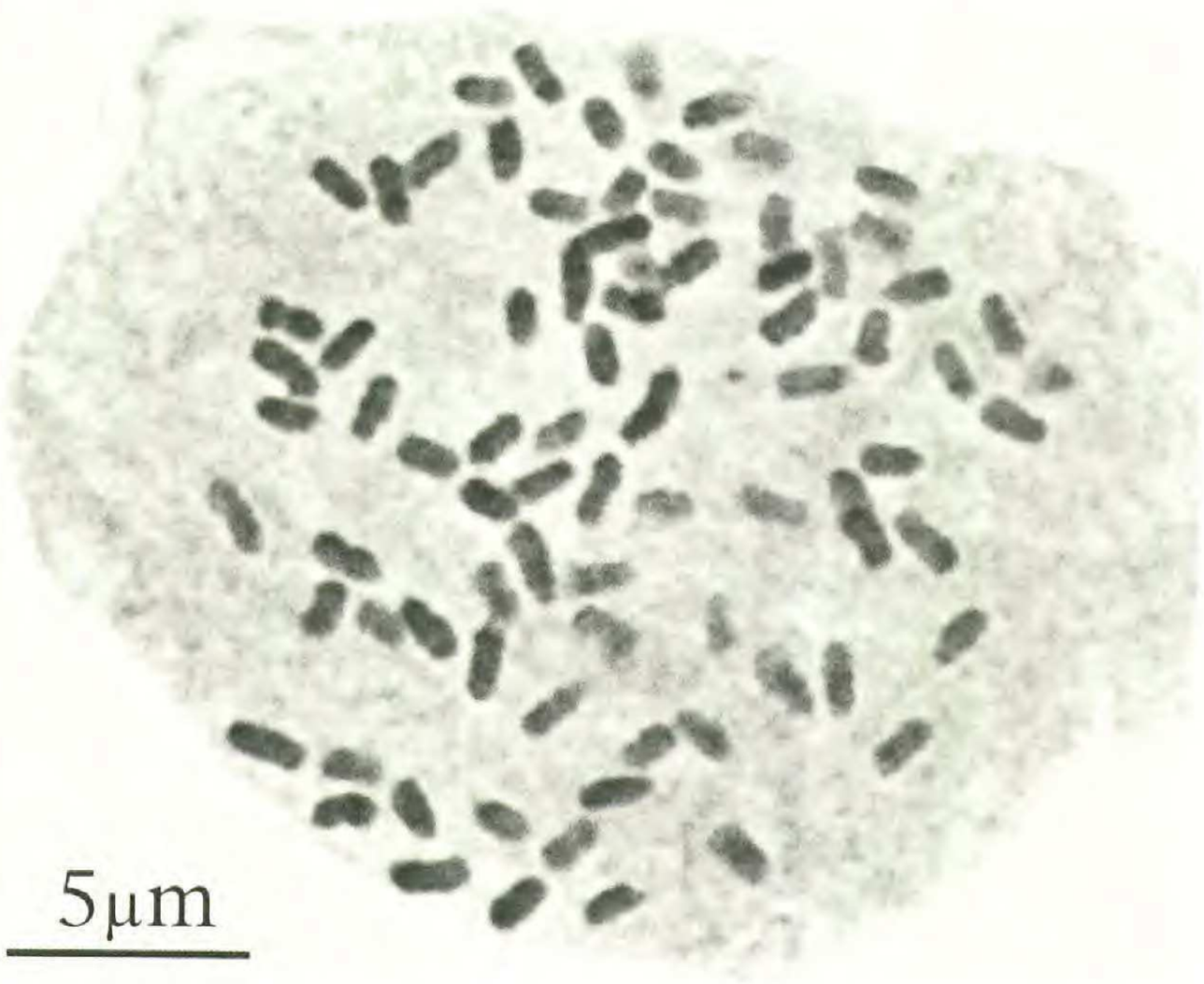

FIG. 3. Somatic chromosomes of *Deparia longipes* from Taiwan, showing 2n = 80.

Deparia longipes (Ching) Shinohara, ***comb. nov.***

Basionym: *Athyriopsis longipes* Ching, Acta Phytotax. Sin. 9(1):68 (1964). Type – China: Kunming, Sih-shan, Hua-ting-tze, 6 July 1945, *T. N. Lion 14278* (holotype: PE!)

This species belongs to *Deparia* based on the shallow rachis groove, which does not open at the junctions with the costae (Fig. 1–B).

Most species in sect. *Athyriopsis* sensu Kato (1977; 1984) are tetraploid or hexaploid. Diploids are known only in *D. petersenii* from Taiwan (Shinohara *et al.*, Int. J. Plant Sci. 167(2): 299–309. 2006). Polyploids are derived from diploids, and therefore information on ancestral diploid cytotypes is indispensable for understanding the origin of polyploids. The diploid cytotype of *D. longipes* found in the present study is, therefore, important for further biosystematic study of this group of ferns.

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